ITT

Wastewater

Goulds Pumps

WS_BHF Series Model 3887BHF

Submersible Sewage Pump

Prosurance available for residential applications.

FEATURES

- **Impeller:** Cast iron, enclosed, non-clog, dynamically balanced with pump out vanes for mechanical seal protection.
- **Casing:** Cast iron flanged volute type for maximum efficiency. Designed for easy installation on A10-20 slide rail or base elbow rail systems.
- **Mechanical Seal:** Silicon Carbide vs. Silicon Carbide sealing faces for superior abrasive resistance, stainless steel metal parts, BUNA-N elastomers.
- **Shaft:** Corrosion resistant, 300 series stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.
- **Fasteners:** 300 series stainless steel.
- Capable of running dry without damage to components.
- Designed for continuous operation, when fully submerged.

GOULDS PUMPS

AGENCY LISTINGS

Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association — File #LR38549

Goulds Pumps is ISO 9001 Registered.

Goulds Pumps is a brand of ITT Corporation.

www.goulds.com

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APPLICATIONS

Specifically designed for the following uses:

- Homes
- Sewage systems
- Dewatering/Effluent
- Water transfer
- Light industrial
- Commercial applications

Anywhere waste or drainage must be disposed of quickly, quietly and efficiently.

SPECIFICATIONS

Pump

- Solids handling capabilities: 2" maximum.
- Capacities: up to 220 GPM.
- Total heads: up to 81 feet TDH.
- Discharge size: 2" NPT threaded companion flange as standard. 3" option available but must be ordered separately. (Order no. A1-3)
- Temperature: 104°F (40°C) continuous
  140°F (60°C) intermittent.

MOTORS

- Fully submerged in high grade turbine oil for lubrication and efficient heat transfer. All ratings are within the working limits of the motor.
- Class B insulation on ½-1½ HP models.
- Class F insulation on 2 HP models.

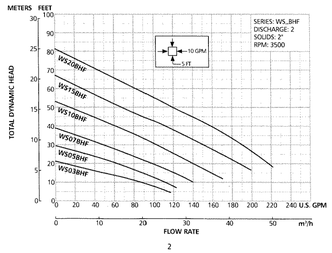
Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ½ – 1 HP models have NEMA three prong grounding plugs.
- 1½ HP and larger units have bare lead cord ends.

Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.

- **Designed for Continous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **Bearings:** Upper and lower heavy duty ball bearing construction.
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **Motor Cover O-ring:** Assures positive sealing against contaminant and oil leakage.



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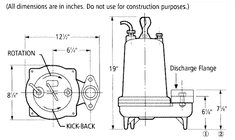
MOTOR AND MODEL INFORMATION

ORDER NUMBER	HP	PHASE	VOLTS	RPM	IMPELLER DIA. (IN.)	MAX. AMPS	LOCKED ROTOR AMPS	KVA CODE	FULL LOAD MOTOR EFF. %	RESISTANCE START	RESISTANCE LINE-LINE
WS0311BHF	0.33	1	115	3500	2.94	12.4	46.0	M	54	7.5	1.0
WS0318BHF	0.33	1	208			6.8	31.0	K	68	9.7	2.4
WS0312BHF	0.33	1	230			6.2	34.5	M	53	9.6	4.0
WS0511BHF	0.5	1	115		3.19	14.5	46.0	M	54	7.5	1.0
WS0518BHF	0.5	1	208			8.4	31.0	K	68	9.7	2.4
WS0512BHF	0.5	1	230			7.6	34.5	M	53	9.6	4.0
WS0538BHF	0.5	3	200			4.9	22.6	R	68	–	3.8
WS0532BHF	0.5	3	230			3.6	18.8	R	70	–	5.8
WS0534BHF	0.5	3	460			1.8	9.4	R	70	–	23.2
WS0537BHF	0.5	3	575			1.5	7.5	R	62	–	35.3
WS0718BHF	0.75	1	208		3.44	11.0	31.0	K	68	9.7	2.4
WS0712BHF	0.75	1	230			10.0	27.5	J	65	12.2	2.7
WS0738BHF	0.75	3	200			6.2	20.6	L	64	–	5.7
WS0732BHF	0.75	3	230			5.4	15.7	K	68	–	8.6
WS0734BHF	0.75	3	460			2.7	7.9	K	68	–	34.2
WS0737BHF	0.75	3	575			2.2	9.9	L	78	–	26.5
WS1018BHF	1	1	208		3.75	14.5	59.0	K	68	9.3	1.1
WS1012BHF	1	1	230			13.0	36.2	J	69	10.3	2.1
WS1038BHF	1	3	200			8.6	27.6	M	77	–	2.7
WS1032BHF	1	3	230			7.5	24.1	L	79	–	4.1
WS1034BHF	1	3	460			3.8	12.1	L	79	–	16.2
WS1037BHF	1	3	575			3.1	9.9	L	78	–	26.5
WS1512BHF	1.5	1	230		4.00	18.0	52.0	J	67	2.76	0.53
WS1538BHF	1.5	3	200			10.0	42.4	K	78	–	1.7
WS1532BHF	1.5	3	230			9.6	42.4	K	78	–	1.7
WS1534BHF	1.5	3	460			4.8	21.2	K	78	–	6.6
WS1537BHF	1.5	3	575			3.9	16.3	L	78	–	10.5
WS2012BHF	2	1	230		4.44	18.0	49.6	F	78	3.2	1.1
WS2038BHF	2	3	200			12.0	42.4	K	78	–	1.7
WS2032BHF	2	3	230			11.6	42.4	K	78	–	1.7
WS2034BHF	2	3	460			5.8	21.2	K	78	–	6.6
WS2037BHF	2	3	575			4.7	16.3	L	78	–	10.5

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



Discharge Flange:
① 2" NPT standard
② 3" NPT optional (order an A1-3)

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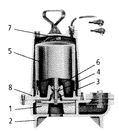
PERFORMANCE RATINGS (gallons per minute)

Order No.		WS03BHF	WS05BHF	WS07BHF	WS10BHF	WS15BHF	WS20BHF
	HP ▸	½	½	½	1	1½	2
	RPM ▸	3500	3500	3500	3500	3500	3500
Total Head in Feet	10 ▸	86	110	140	–	–	–
	15	48	88	120	158	–	–
	20	–	62	98	139	186	217
	25	–	32	74	120	170	204
	30	–	–	49	101	150	190
	35	–	–	21	82	130	175
	40	–	–	–	60	110	159
	45	–	–	–	38	88	140
	50	–	–	–	–	67	120
	55	–	–	–	–	47	100
	60	–	–	–	–	29	80
	65	–	–	–	–	–	62
	70	–	–	–	–	–	43
	75	–	–	–	–	–	23

COMPONENTS *(for reference only)*

Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring



** For repair parts, reference repair parts book.*

GOULDS PUMPS

B3887BHF April, 2007

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SANITARY SEWAGE DUPLEX PUMPSTATION NARRATIVE

This pump station is to consist of two submerged solids handling pumps capable of passing 2" solids, mounted within a 8' diameter concrete wet well. The station is to discharge to a 2" SDR 21 pressure class 200 PVC force main. There will be a separate concrete valve box where the discharge piping from each pump will be merged. There will be a NEMA 4X all weather control panel mounted to the building and clearly labeled as to purpose.
This station will meet Class 1 reliability standards as stated in 9VAC25-790. The station will be served by the power distribution system of the new building and emergency power will be supplied by the building's proposed back-up generator. There is to be a visual alarm located on the exterior of the building at the control panel consisting of a flashing light. There is to be an audio and visual alarm centrally located within the building. There is to be an auto dialer which is compatible with Loudoun County's alarm network.

FORCEMAIN

PVC Pressure Pipe: 2" minimum PVC AWWA C900/905 SDR 21, pressure Class 200 with epoxy coated ductile iron fittings. Gasketed joints and using ASTM F 477, elastomeric seals

Standard Fittings: AWWA C110, ductile or gray iron, for push-on joints
PUMP STATION
Pump Station shall meet the requirements of the Virginia Department of Environmental Quality, Sewage Collection and Treatment Regulations.
A. Wet Well Mounted Pump with an average flow of 820 GPD with the following capabilities and components:
1. 2- Submerged, solids handling pumps: 2" discharge Pumps with 1 HP Minimum Power. Pumps to be capable of passing a 2" solid.

ELEVATION HEAD: 542 - 521.5 = 20.5'
FORCEMAIN LENGTH: 2200 L.F.
FITTING AND CONSTRUCTION VARIANCE ALLOWANCE:
FORCEMAIN HEADLOSS FOR 2" SDR 21 PVC @20 GPM: 0.86 FT/ 100 FT
FORCEMAIN HEADLOSS = 0.86 X 2200/100 = 19'
TOTAL DYNAMIC HEAD (TDH): 39.5' USE 40'

*Pumps shall be capable of pumping at 20 gpm at 40' TDH.

Forcemain velocity check: A of 2" pvc = 0.022 sf
20 gpm = 0.045 cfs
Flow Velocity = 0.045/0.022 = 2 fps

Flow rate check: 820 gpd/8hour day = 1.7 gpm average
Peak flow rate = 1.7 gpm x 2.5 = 4.3 gpm < 20 gpm pumping rate O.K.

2. Pump Controls and Panel: as recommended by pump manufacturer including mercury floats for the water level and alarms. The unit shall be installed in a NEMA 3R enclosure with door lock for indoor/outdoor use. See Alarm System, Flow Measurement, and Diagnostic, Control and Information Systems below for related equipment. Panel shall also house the following: 60 watt lamp, single phase transformer, 110v gfi receptacle.
3. Alarm Telemetry: See Alarm System below.
4. Check Valves: 2" Spring-loaded, non-slamming check valves with external-arm design.
5. Gate Valves: 2" AWWA C515.
6. 24 hour pumpdown setting: pumpstation shall pump the effluent level down to the pump off elevation once every 24 hours
7. All fittings shall be stainless steel.
8. Wetwell shall be HDPE lined.

B. Available Manufacturers
1. Gould Pumps WS1032BHF Series, 3500 rpm, 3.75" dia impellor, 2" discharge, 1HP, 3Phase & 230Volt
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified above.

C. Alarm System

1. Alarm system to monitor high and low water levels pump failure, power failure and generation running, and a test function. Alarm telemetry shall also include a flow failure alarm via current sensors. Alarm signal shall be audible and include a separate autodialer to transmit alarm condition to County personnel.
   a. Alarms shall include visual and audible at the station site, visual and audible at (a) remote location(s) through the autodialer.
   b. The flow failure alarm will utilize current sensors to measure under current. During startup the adjustable range of the current sensors shall be set by the pump manufacturer's representative based on the current draw of the pumps. When the pumps fall below a certain percentage set in the field then an alarm will be triggered sensing flow failure. A field adjustable time delay will also be used to prevent nuisance tripping. This will trigger the alarm system.
   c. The autodialer shall be capable of digital voice recording and storage. The unit will automatically telephone up to 8 numbers when an alarm condition is activated at the station until the alarm has been acknowledged.

D. Flow Measurement

1. Flow meter to be Dynasonics model (transmitter indicator and totalizer) with a usable range from 0.1-30 feet per second. The meter shall transmit a flow proportional signal to a circular chart recorded by ABB Kent Taylor Commander 1900 which is capable of recording flow rate at any given time, as well as totalizing the flow through the force main.

E. Diagnostic, Control, and Information Systems
1. Diagnostic and Information System shall be an acceptable unit manufactured by ABB Inc or approved equal. The unit node box is to be installed in NEMA 3R enclosure with door lock for indoor/outdoor use, equipped with the most current system upgrades. System shall be capable of interfacing with the College's existing pump station monitoring program and communications network.
2. Station shall automatically pump effluent in the wet well out until the level reaches the "Pump Off" level once every 24 hours.
3. During normal operations pumps shall alternate for each pump down event.
4. System shall include low voltage, short circuit, and overload protection on all three phases

SUBMITTALS: Contractor shall make the following submissions to the Owner unless noted otherwise.

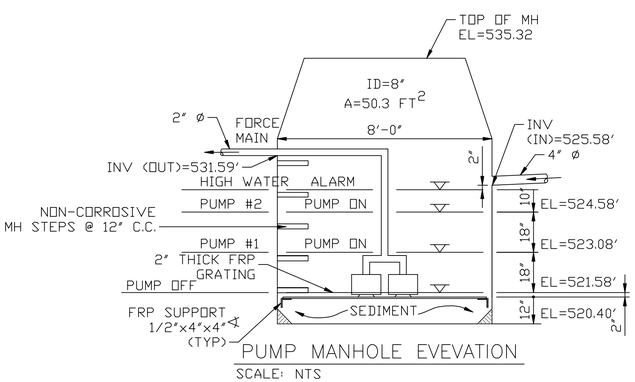
Pump Station. Submit all pertinent data for the construction and operation of the pump station. Data to be included but not limited to pumps control panel, alarm auto-dialer, valves, odor and corrosion control equipment, flow meters, flow recorder, and diagnostic and information system.

Certification and supporting documentation, sealed and signed by a Professional Engineer registered in the state of Virginia, stating that pump's operating parameters in both solitary operation, and when operating concurrently with the Middletown Elementary School's pump station.

A complete O&M manual shall be provided and contain approved shop drawings, catalog cut sheets, equipment model with serial numbers, installation instructions, maintenance schedules, list of recommended spare parts, warranties, names and telephone numbers for local equipment representative for each item of equipment

Approval of the O&M manual is required by Virginia Department of Health (VDH) and Department of Environmental Quality (DEQ). The manual must be approved by all agencies prior to College's acceptance of the station

As Built Drawings: one set of mylars and 3 sets of blue prints



FRP=FIERGLASS REINFORCED PLASTICS

ESTIMATED LOAD ON GRATING ±150 psf

HUGHES GROUP ARCHITECTS
45640 WILLOW POND PLAZA
STERLING, VIRGINIA 20164
703.437.6600

CIVIL:
ALPHA CORPORATION
21351 Ridgetop Circle, Suite 200
Dulles, Va 20166
(703) 450-0800

STRUCTURAL:
EHLERT-BRYAN
1451 Dolley Madison Blvd. Suite 220
Mclean, VA 22101
(703) 827-9552

MECHANICAL/ELECTRICAL:
BRINJAC ENGINEERING
4000 Albermarle Street, NW
Washington, DC 20016
(202) 237-2750

PURCELLVILLE FIRE AND RESCUE

500 NORTH MAPLE AVENUE
PURCELLVILLE, VIRGINIA

SANITARY SEWAGE PUMP DETAILS

KEY PLAN

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REVISIONS:

ISSUES:
09-26-07 BID SET

STAMP AND SEAL:

DATE: 09-26-07
SCALE: AS NOTED

PROJECT NO. 0611

SHEET: C-136